STUDIES ON THE PREPARATION OF DEHYDRATED SHARK MEAT

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ABSTRACT

Dehydrated fish meat, similar to fish flour is considered one of the cheapest sources of animal protein. It is prepared from any of the steamed fish muscles of tuna, shark, round scad and othep cheap species of fish. The addition of soy sauce and small amount of sodium glutamate (vet-sin) improves the taste and palatability of the final product.

Dehydrated shark meat with small amounts of dried carrots, celery, cabbage and powdered white pepper is highly recommended as a palatable soup.

In the Philippines where the poor people live on rice and dried fish alone, the addition of dehydrated shark meat soup would enhance the improvement of the people's diet.

The chemical analysis of dehydrated shark meat reveals that it is highly comparable with other sources of animal protein food.

INTRODUCTION

The manufacture of dehydrated shark meat was conceived to meet the all-time rising demand for cheap protein food vitally needed to improve the diet of the rapidly-increasing population of the world, not excluding the Philippines.

Food technologists, dieticians, nutritionists and various international food organizations are in search of cheap but high food value protein materials from the marine resources for growth and health of poor and underprivileged people.

One of the main causes of malnutrition is insufficiency of the amount of protein in the diet due to high cost of protein foods, such as milk, cheese, beef, pork and poultry that the common people could hardly afford. The availability, therefore, of cheap protein food to increase the food value of the ordinary diets thereby promoting good health among the people, and consequently a much stronger nation as a whole, is the crying need of the time.

Malnutrition causes more fatalities than tuberculosis, malaria and cancer, for its effect is basic, leading to the attacks of pathogenic microorganisms produced by the resulting diseases.

Dietary deficiency leads to inactivity, depression and apathy. In children, it retards growth and development due to loss of weight and may cause physical inactivity, emotional disturbance and and sometimes mental defects. The nutritional element mainly lacking in an inadequate diet is animal protein, whether animal meat, fish, eggs or milk.

This study of preparing dehydrated shark meat was, therefore, conducted to help solve the aforementioned protein food deficiency in the people's diet, for fish is not only the cheapest but the most widely distributed source of the much-needed protein.

EXPERIMENTAL METHODS

Dehydrated fish meat may be prepared, not only from shark, but also from any other

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cheap species of fish not hitherto relished by the consuming public.

Shark of the *Scoliodon spp.* was used in this study, becaused of its abundance in Philippine marine waters.

Dressing. The skin was first removed and chunks of the flesh separated from the bones; then precooked in an open steam for one hour and 100 minutes at 10 lb. pressure; then set aside to cool completely. The cooked flesh was kneaded and then macerated with varying amounts of soy sauce and sugar (Table 1); then half-dried in the sun and lastly, smoked for thirty minutes. The smoked material was then dried completely either in the sun or in an artificially heated drier, after which the dehydrated meat was passed through a wire screen of 3 mm. mesh to obtain uniform size.

Packing. Twenty-gram weight of dehydrated shark meat were packed in cellophane bags and distributed to the consuming public for trial. Other packages contain dehydrated vegetables such as, cabbage, carrots, celery, salt and a dash of powdered white pepper.

Other important uses. Being a concentrated protein food, a 20-gram package of dehydrated shark meat mixed with two cups of boiling water produced a nutritious soup recommended for the rich and poor.

The food value may be improved greatly with the addition of dehydrated chopped cabbage, carrots, celery, a dash of powdered white pepper and tablespoonful of evaporated milk.

The incorporation of dehydrated shark meat in boiled rice *(lugaw)*, would improve its food value. This product would serve fully well as additive in many culinary Filipino dishes such as, *pancit*, *ukoy*, vegetable soup, *pinakbet*, etc., not only to improve their food value, but the taste and flavor as well.

Chemical analysis. Dehydrated shark meat was chemically analyzed and compared with other animal protein food (Table 2).

RESULTS AND DISCUSSION

The manufacture of dehydrated fish meat is an important step in the proper utilization of shark meat and other cheap species of fish that abound in great quantities in many Philippine marine waters. Shark meat has practically no commercial value in the Philippines, and the conversion of its flesh into dehydrated meat would be a boon to the shark fishing industry. The availability of this cheap protein food to the masses at very low price, which is within the reach of everyone would improve greatly the health, and lessen cases of malnutrition in this country.

Cooking process. Shark meat has that particular urea-smell and cooking the meat for not less than 100 minutes at 10 lb. pressure, eliminated greatly this particular oder.

Treating the shark flesh with acid to neutralize the alkaline compound seemed to eliminate the objectionable odor, but steaming the flesh for more than 1½ hours was found to be very satisfactory and more economical.

The incorporation of soy sauce and brown sugar improved the taste and final smoking of the product before complete drying, resulted in the production of a shrimp-like taste and flavor of dehydrated fish meat.

Tasting trials. Twenty-gram samples of dehydrated shark meat with 5 per cent each of dried vegetables, such as cabbage, carrots, celery, powdered white pepper, salt and evaporated milk were distributed to the consuming public for tasing trials or acceptance. They claimed that the product has shrimp taste and flavor and the addition of two cups of boiling water produced a tasty soup.

The laboring class who live mainly on rice and dried fish would improve their diet greatly with the addition of dehydrated shark meat soup in their meal.

Chemical analysis. The protein content of four experimental samples of dehydrated shark meat are much higher than any other animal meat, ranging from 59.10 to 40.07 per cent or an average of 50.35 per cent (Table 2), although the percentages of fat are rather low.

Fish proteins are 85 to 95 per cent digestible and biological studies revealed that all the dietary essential amino acids, which are needed to give growth and maintenance to the body are also present, and that an average serving of it would supply sufficient amount of animal protein to satisfy daily body requirement.

SUMMARY AND CONCLUSION

Fish flour had been prepared by the Bureau of Fisheries from various species of shark as

well as fish meal from cheap species of fish and cannery fish scraps. Dehydrated fish meat is a new product manufactured by the Technological Research Section of the Philippine Bureau of Fisheries.

This study was undertaken because of the waste of shark meat due to lack of proper know-how in its utilization and at the same time majority of the Filipino people do not relish shark meat, because of the psychological connection that sharks are man-eaters. Thus, to utilize this tremendous amount of highly expensive food item, which is protein, shark meat was used in this study.

The production of dehydrated fish meat with a shrimp-taste was accomplished by masking the fishy taste with good brand of soy sauce and other condiments.

Cooking the shark meat for 100 minutes at a pressure of 10 lb. was found very effective in eliminating the urea-like smell and flavor of the fish.

The product is well accepted by the consuming public because of its shrimp-like taste, which does not only increase the food value, if added to any dish, but give good flavor and taste as well. As an additive to many Filipino dishes, dehydrated shark meat will find its many uses.

The chemical analysis reveals that dehydrated fish meat is high in food value and by lowering the moisture content to less than 10 per cent, the keeping quality would be greatly enhanced.

Lastly, dehydrated shark meat with the addition of dried vegetables such as cabbage, carrots, celery, etc., is highly recommended to improve the food value of various diets, as well as impart good flavor and taste to them.

Table I. – Showing various treatments in the manufacture of dehydrated shark meat.

Shark meat (raw) gm.	Cooking time min.	Smoking time min.	Weight after cooking gm.	Cooked shark meat gm.	Soy sauce used ml.	Brown sugar used gm.	Remarks
I — 4,000	60	30	2,340	1,000	200	100	Open steam
II — 8,000	100	30	4,040	1,000	250	200	10 lb. press
III — —	—	30	—	1,000	300	300	—
IV — —	—	—	—	1,000	—	300	+ 30 gm. Vet-sin.

Table 2. – Proximate Chemical Composition of Dehydrated Shark Meat Treated according to Table 1, compared with Other Animal Protein Products.

Dehydrated Shark meat	Moisture	Ash	Protein (N x 6.25)	Fats (E.E.)
No.	Per cent	Per cent	Per cent	Per cent
I	11.36	11.56	50.47	0.99
II	12.31	12.36	52.13	1.07
III	14.11	5.17	40.07	1.63
IV	9.91	12.00	59.10	0.31
Other animal protein food :				
Beef, dried	–	–	29.70	6.50
Lamb, broiled	–	–	21.20	29.70
Pork, bacon smoked	–	–	9.90	64.80
– Ham, smoked	–	–	20.20	20.80
Veal, chops	–	–	19.40	10.00
Chicken, broiled	–	–	21.60	2.50
- - - -, roast	–	–	25.00	11.10
Duck	–	–	18.00	19.00